Research on Massachusetts Silver coins.

3 messages

Chris Salmon [redacted] Sat, Apr 16, 2011 at 5:56 PM
To: EricNumis@aol.com

Dear Eric,

It's been a long time since we have corresponded. I trust that you are doing well!

I am writing to let you know about my latest research activities. I've begun performing scanning electron microscopy and x-ray microanalysis on Massachusetts silver coins.

I have fostered a close working relationship with scientists at Arizona State University, and they have allowed me to use their electron microscopes in an unsupervised manner (even though I am not on faculty at the university). What has helped me is my professional background as an academic radiologist and my 25 years of experience in computerized imaging. I now want to offer a service to numismatic researchers, collectors, and dealers by providing scanning electron microscopy and x-ray microanalysis on coins.

Working with the Massachusetts silver coinage I am hoping to get high resolution topographic imaging detail for hand-struck varieties, as well as those produced by the rocker press and screw press, to determine if there are differences among these that can be seen with scanning electron microscopy. This may shed new light on minting techniques for these important coins.

I'm also performing x-ray microanalysis with the scanning electron microscope. As you know, this provides precise elemental analysis easily and in a non-destructive, harmless manner.

I wanted to immediately send you some fascinating results I've found by scanning a circulating counterfeit: an example of the classic Noe 13 Pine Tree shilling (a variety I designate as the 13-X Pine Tree shilling in my new book). **Please see the attached document.**

I thought that the results for this coin were quite surprising. I would love to hear your opinion. Any assistance and insight you can provide would be greatly appreciated, since you are the foremost expert in this area of research!

Thank you! I look forward to our future correspondence. Please let me know if there are any coins you would like to study with scanning electron microscopy or if you would like to work together on any projects!

It would be the greatest honor to work with you!

All best wishes and warm regards,

Chris

SILVER CONTENT OF A CONTEMPORARY CIRCULATING COUNTERFEIT OF THE MASSACHUSETTS SILVER SERIES.docx
11115K

EricNumis@aol.com <EricNumis@aol.com> Sun, Apr 17, 2011 at 2:34 PM
To: [redacted]

Dear Chris:
.It was a pleasant surprise for me to hear from you again and to have you bring me up to date as to your continuing numismatic research.
I have read your new book and I congratulate you on that major accomplishment. I will study it further as I realize that I will need much more time to absorb what you have presented. As you probably know I was not asked to read any part of the preliminary manuscript and I subscribed to the book as early as ANS announced it.
I want to tell you that at the present time I am having some electron scanning and
other measurements done by professors at Washington University in St. Louis (not at the Medical School) on a couple of Massachusetts silver coins. I am glad you can do this type of work with the modern equipment because I only can do simple weight, size and approximate specific gravity at home.
I have a couple of research friends with whom I have long shared thinking on subjects of their and my mutual interest and I hope you have no objection to my appropriately sharing with them any information in your communications to me unless you feel otherwise as to any items. Naturally you expect and hope all of us study and discuss your published material.
My father was a surgeon having become an intern in St. Louis in 1901 and he practiced proctology using sulfur long before modern antibiotics. My best yo you Eric. .
[Quoted text hidden]

Chris Salmon [redacted] Sun, Apr 17, 2011 at 4:46 PM
To: EricNumis@aol.com

Dear Eric,

I enjoyed your note very much. Thank you for your supportive comments regarding my book. The information on your father is fascinating. How much medicine has changed in such a short time!

I am very happy to share all of my findings with you—and for you to share them, in turn, with others. I would ask that you (and your research associates) regard the document that I sent to you yesterday as a "work in progress." Its conclusions may be expanded or modified as I work on it further. I just wanted to let you know of this early finding promptly. When new information becomes available I will be more than happy to send it to you.

Please let me know what you find out from your Massachusetts silver coin analyses. Perhaps we can combine our findings into a formal paper or report? I'd be happy to contribute to a collaborative study. I am planning to study a wide variety of Massachusetts silver coins and hope to accumulate extensive useful data. Please let me know if there is anything I can do to help!

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Gmail Eric Newman <ericnumis106@gmail.com>

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SILVER CONTENT OF A CONTEMPORARY CIRCULATING COUNTERFEIT OF THE MASSACHUSETTS SILVER SERIES

Christopher J. Salmon, M.D.

The Massachusetts Silver coins are known to have circulated widely and for a long time, even to the Federal period. During this prolonged term of commercial use several varieties of counterfeits were produced and can now be identified. One of these, the 13-X Pine Tree shilling, was classified as a regular mint issue by Noe and Crosby, and is traditionally referred to as the Noe 13 or Crosby 9-G variety.

The 13-X Pine Tree shilling is very similar in quality and workmanship to the 14-X (Noe 14; not in Crosby) and 15-X (Noe 31; Crosby 8-E) varieties, which are probably produced by the same workshop (Salmon 2010, page 21). Little specific information is available for these rare varieties, especially physical data (except for weight and diameter).

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13-X Pine Tree shilling. Collection of the author (ex-F.C.C Boyd; ex-John J. Ford, Jr).

We have determined the silver content of a 13-X Pine Tree shilling, illustrated above, by energy dispersive spectrometry x-ray microanalysis performed on a Philips XL-30 Environmental Scanning Electron Microsope. To our knowledge this is the first elemental analysis of a 13-X Pine Tree shilling or any other circulating counterfeit of the Massachusetts silver series.

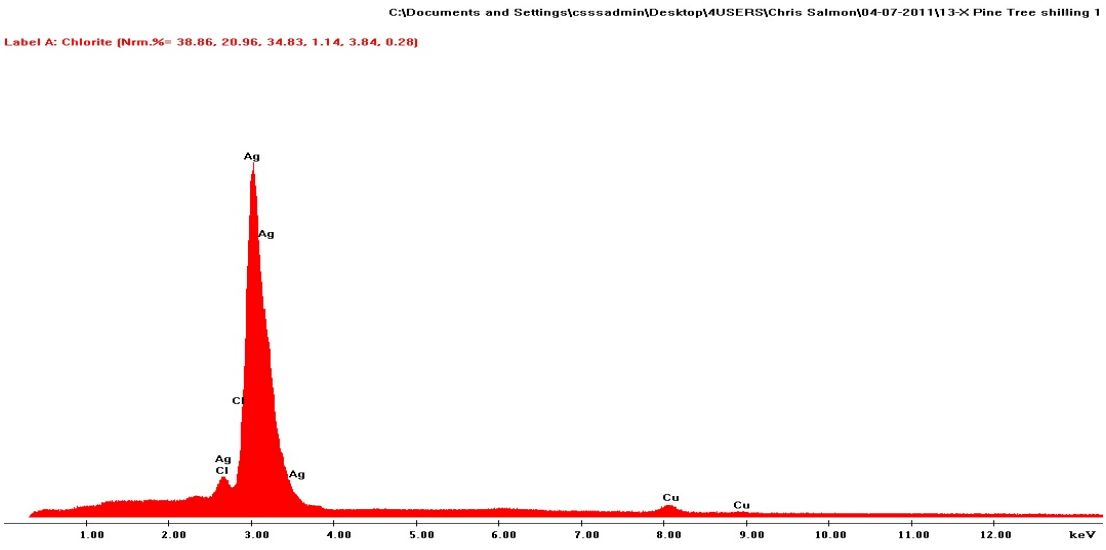
The alloy content for thirteen samplings of this 13-X specimen were as follows (all data reported in weight percent):

SILVER	COPPER	IRON

1.	94.23	5.77	
2.	96.80	3.20	
3.	97.02	2.98	
4.	96.90	3.10	
5.	96.62	3.38	
6.	94.42	5.58	
7.	93.60	6.40	
8.	96.37	3.63	
9.	94.58	5.42	
10.	96.59	3.41	
11.	94.29	3.47	2.24
12.	96.77	3.23	
13.	96.82	3.18	

AVERAGE SILVER COMPOSITION BY WEIGHT= 1245.01/13= **95.77%**

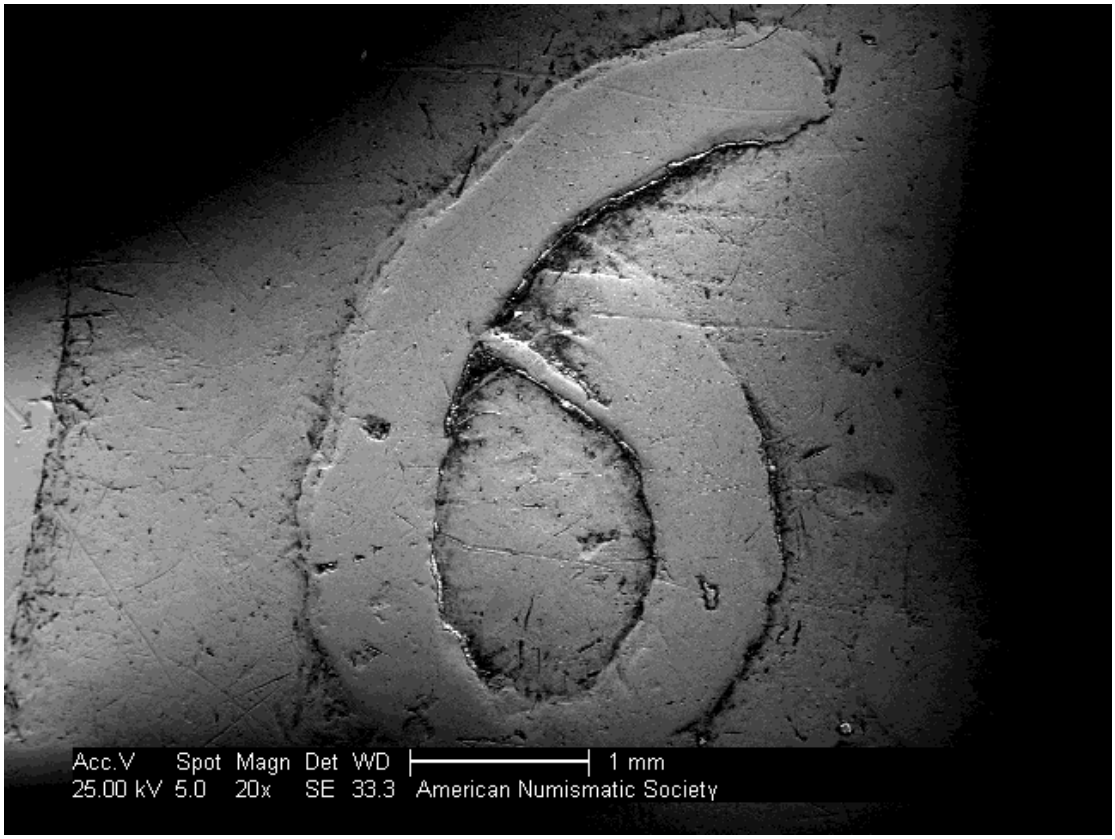
The above analyses were made by interrogating different areas of the obverse and reverse surfaces. Topographic scanning electron microscopy (SEM) images of the coin surface were first obtained, and appropriately smooth areas of the coin surface then selected for x-ray microanalysis. Regions free of encrustation or apparent inclusions were generally employed, since these were felt to give the most representative results in terms of internal content for the coin. Areas on both obverse and reverse were examined, chiefly on the background fields rather than on struck-up elements, such as characters, numerals, inner circle dots, or tree.



SEM x-ray microanalysis. Energy-dispersive spectrum. 13-X Pine Tree shilling.

One exception to this approach was the area from which sample #11 was obtained. In this case the smooth surface of the numeral 6 of the date was interrogated., revealing a small, but apparently significant, iron peak in the energy dispersive spectrum. The reason for this seeming anomaly of discernible iron content is not certain. We posit that it could be an artifact of striking with an iron die that left microscopic ferrous residue on the surface of the 6. The proof of this hypothesis awaits confirmation by future analysis with other coins.

Interestingly, the areas of encrustation, also purposely selected by visual inspection of SEM surface images, yielded markedly different results.



Topographic SEM image. Note the encrustation along the edges of the numeral, rendered as a thin and irregular bright edge.

For example, encrustation along the edge of the right side of the long upper stroke of the numeral 6 in the date yielded the following analysis:

CARBON	44.82%
OXYGEN	25.79%
SILICON	1.32%

SULFUR	0.77%
CHLORINE	1.18%
SILVER	4.41%
POTASSIUM	0.87%
COPPER	1.81%

This presumably represents an amalgam of organic material with (minimal) contribution from soil silicates. There is a small amount of silver in the interrogated volume, but no iron. The silver peak may arise by inclusion of a small amount of the coin surface within the sampling volume, or could have migrated or been leached from the coin surface by environmental factors related to coin burial.

The finding of silver fineness exceeding sterling in a circulating struck counterfeit is surprising and unexpected. One might naturally assume that the fabricators would employ an alloy of minimum feasible silver content in order to maximize the profits from their enterprise. There are several possible explanations to account for the unusual fineness, weight, and overall appearance of the 13-X and related varieties of circulating counterfeits.

The first consideration is the source of the silver. The easiest obtainable source of silver bullion for the counterfeiter of late 17th or early 18th century was circulating specie. The most important of these were the Spanish American 8 *reales* and fractions. They had an authorized silver content of 93.05% until 1728. It is possible that they may have been used directly as a primary source of the metal for the 13-X Pine Tree shilling without significant alteration.

The eight examples of the 13-X for which weights are known include the following:

1. Salmon; the study coin	39.2 grains
2. Hain, lot 129	51.2 grains
3. Roper, lot 33	47.2 grains
4. Massachusetts Historical Society; Noe 1952, p. 34	47.6 grains
5. Norweb, lot 1204	43.7 grains
6. Eliasberg, lot 2024	45.5 grains
7. ANS 1955.83.1	34.0 grains
8. ANS 1964.66.1	39.7 grains

The average weight for these is 43.5 +/- 5.6 grains. This is essentially identical with known weights for four examples of the 14-X variety (43.5 +/- 4.9 grains). The only known specimen of the 15-X variety is holed and weighs 36.4 grains. Examples of all three varieties are drastically underweight, though consistent with one another within a close range. All appear worn and clipped to a short flan size. The foregoing strongly suggests that they were made to mimic clipped and worn pieces in order to conceal their illicit nature and facilitate their commercial use.

The high proportion of silver shown in this report may indicate that the output of the counterfeiter was meant to pass "by tale" –or at face value—as a lightweight shilling in New England, approximately contemporary with the standard mint issues. If this were the case, the counterfeit coinage would yield a profit of up to 40% based on a theoretical shilling weight of 72 grains [(72-43.5)/72 =40%].

Alternatively, the 13-X, 14-X, and 15-X Pine Tree shillings may have been intended to circulate outside New England. During the last decade of the seventeenth century, precious metal coins began to be accepted only per weight. This essentially removed the incentive for clipping coins: coins of reduced weight would no longer be accepted at full value. After 1693 the weight standard for a Spanish American 1-*real* was set at 45 grains (based on an 8-*reales* standard of 15 dwt) in New York and Philadelphia, where the New England coinage had long passed freely in commerce. The silver content of the 13-X and related counterfeit varieties was, then, essentially equivalent to the currently circulating Spanish-American 1 *real* pieces in both cities, and the counterfeits might have been intended to circulate at a value of 1-*real* in one or both of those locations. It is difficult to see significant advantage to the counterfeiters under this scenario, particularly in the context of severe punishments then visited upon individuals forging or debasing the coinage.

Still, other instances of circulating counterfeits of Massachusetts silver coins in this weight range are known, including extremely rare pieces noted to be directly overstruck on 1-*real* pieces. Two of these coins were discovered by Robert Vlack when he catalogued the Stearns Sale, though they were not included in that sale. Gary Trudgen reported the two pieces in the Colonial Newsletter in 1984, both having clearly identifiable 1781 Mexican 1-*real* undertypes. The author has recently acquired a third example of this variety, struck with the same dies as the other two known pieces, but with a 1746 Pillar 1-*real* undertype. The coin, designated here as the 16-X Pine Tree shilling, is illustrated below:

16-X Pine Tree shilling, overstruck on a 1746 Pillar 1-*real* piece. Collection of the author.

It is intriguing that these 16-X overstruck circulating counterfeits are so reminiscent of the 13-X, 14-X, and 15-X Pine Tree shilling circulating counterfeits. They certainly have stylistic similarity, particularly in the arc of their curved primary tree branches and the morphology of the broadly based triangular secondary branches. The varieties are certainly far more similar to one another than to any bona fide issues of the Massachusetts silver coinage. It is also notable, in keeping with the 13-X, 14-X, and 15-X varieties, that the 16-X coins are also struck with dies that are "too big" for their (full-weight undertype) flans, giving the appearance of having been clipped circumferentially. Further work is needed to trace any closer relationship than the sharing of these attributes between the 13-X, 14-X, 15-X trio and the late 18th-century overstrikes designated as 16-X.

Finally, the finding of higher than expected silver content such as found in this study for the 13-X Pine Tree shilling could be due, in part, to other factors, and may be purposeful rather than accidental. Workers in silver sometimes prefer using a higher purity silver alloy than sterling for simply technical reasons.

John Hull and Robert Sanderson, Sr., directors of 17th century Massachusetts mint, were silversmiths by training and their non-minting activities occupied the majority of their professional time and attention. They were, in fact, the first-established and preeminent silversmith practice in British North America in their time, training many fine silversmiths later esteemed in their own right. John Hull's earliest known work is also the only piece to bear the his touchmark alone (i.e., without that of Robert Sanderson, Sr.), since it dates to about 1650, two years before the Hull and Sanderson partnership and Massachusetts Mint were established. It's an example of a type of cup called a tunn in 17th century New England idiom. The vessel is somewhat thick-walled and less finely wrought than the master smith's later works, and has silver fineness of about sterling, or 925 parts per thousand. Opposite sides of the tunn had finenesses of 91.7% and 92.6%, and the base about 93.2%.

The remainder of Hull's surviving work bears his mark along with Sanderson's, and has silver content of approximately 95%, with a range of about 93-97.5%. Patricia Kane, Curator of American Decorative Arts at Yale University Art Gallery and foremost expert on Hull and Sanderson, suggests that this higher silver content—found in nearly all of their collaborative output—was chosen by them intentionally, since the finer mixture was more malleable and easier to work (Kane 1987, page 32). It is therefore not surprising that Hull and Sanderson used very high purity silver stock for their coining work, slightly exceeding the authorized fineness of 92.5%—to do otherwise would have been at distinct variance with their everyday practice and experience. Although conjectural, it is possible that the greater softness and pliability of higher grade silver could have contributed to its use in the illicit manufacture of the 13-X pine Tree shillings by later counterfeiters, as well.

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Gmail Eric Newman <ericnumis106@gmail.com>

Another belated Birthday Greeting

1 message

Ray Williams [redacted] Thu, May 26, 2011 at 11:15 AM
To: Eric Newman <EricNumis@aol.com>

From: [redacted]
Sent: Thursday, May 26, 2011 11:13 AM
Dear Eric,

Happy birthday!

Warm regards and many thanks for all you do to advance the study of coins and currency. You have been an idol of mine for 40 years!

All best wishes,

Chris